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Superintendent

January 2005

To: Technology Plan Coordinators

From: Michael Hall, Specialist
ESEA Title II, Part D and E-Rate

Re: Montana Integrated Technology Plan Framework
Integration of ESEA Title II, Part D (Ed Tech) and Universal/Service Fund - E-Rate Technology Plan Requirements

In December 2004, a group of Montana educators met to review the technology program requirements for the No Child Left Behind Act-Ed Tech and E-Rate programs. Understanding that two different sets of technology plan requirements were confusing, the educators set forth to conceptualize an integrated framework that would meet the requirements for both programs and provide guidance in the writing and rewriting of local technology plans.

The Integrated Technology Plan Framework contained herein represents a blending of the technology planning requirements for the ESEA Title II, Part D – Ed Tech program and the E-Rate program. Each element of this document is coded to illustrate the individual program requirement that will be met upon completion of the required information. Program requirements for the Ed Tech program are referenced as Ed Tech with an alphabet letter behind it to denote the specific requirement met. For example [Ed Tech A, B] refers to the Ed Tech program requirements A and B. E-Rate program criteria are referenced as E-Rate with an alphanumeric code [E-Rate 1C]. For ease of reference, both sets of program requirements are attached (see Appendix A).

Districts utilizing the integrated framework (voluntary but recommended) will follow the structure provided and insert their local information. The organizing topics and coding will ensure that all program requirements are met and that the plans are easy to review for compliance with the program requirements.

School District Strategies to utilize the framework:

- Cut and paste the existing district plan into the integrated format,
- Examine all existing parts for currency, clarity and comprehensiveness (with district committee),
- Update existing components as needed,
- Examine the updated draft plan for areas of weakness or omission,
- Develop the components missing from the plan with the district committee, and
- Have the plan approved by committee, teachers, and school board.

Further resources attached: Appendix B, District Assessment Rubric for the Integrated Technology Plan Framework; Appendix C, Glossary of Terms, and Appendix D recommended reference materials.

Attachments

Montana Integrated Technology Plan Framework
Integration of Ed Tech and E-Rate Technology Plan Requirements

District Name CO LE Date

Technology Plan Elements	Ed Tech Reference	E-Rate Reference	Required Information
I. Goals and Strategies for Use of Technology and Telecommunication	Ed Tech A, B	E-Rate 1A, 1B, 1C, 1D	Provide a description of specific goals, aligned with challenging State academic standards and the OPI Ed Tech Plan, for using advanced technology to improve student academic achievement.
A. Goals (Multi-year, three years minimum aligned with state OPI Ed Tech Plan)	Ed Tech B	E-Rate 1C	✓ Goals and objectives that project for a minimum of three years (3-5 years recommended) ✓ Goals and objectives are aligned with OPI Ed Tech Technology Plan goals and objectives (goals are the same as in Ed Tech formula level funding application)
B. Academic Achievement, aligned with 5YCEP goals	Ed Tech A, B		Goals and objectives are aligned with the district five Year Comprehensive Education Plan goals and objectives
C. Student and Teacher Technology Literacy	Ed Tech A	E-Rate 1A, 1B, 1D	✓ Goals for improving student technology literacy ✓ District assessment of student technology literacy ✓ Goals for improving teacher technology literacy ✓ District assessment of teacher technology literacy
II. Strategies (realistic)	Ed Tech C, D, H, I, J, K	E-Rate 1A, 1B, 1C	Provide strategies for improving academic achievement and teacher effectiveness – description of how Ed Tech funds and E-Rate discounts will be used to improve the academic achievement, and technology literacy, of all students and to improve the capacity of all teachers to integrate technology effectively into curriculum and instructions. Detail the strategies necessary to accomplish the plan goals (professional development, technology acquisition, etc.).
A. Promotion of research based Curricula and Teaching Strategies that Integrate Technology	Ed Tech D	E-Rate 1A, 1B	✓ Describe how the district will identify and promote curricula and teaching strategies that integrate technology effectively into curriculum and instruction.
1. Based on a review of relevant research	Ed Tech D		✓ Cite relevant research to support the curriculum and teaching strategies promoted through the technology plan.
2. Aligned to Montana Content and Performance Standards	Ed Tech D		✓ Demonstrate the alignment of technology plan goals, objectives, and activities to the Montana Content and Performance Standards.
3. Proven to improve student academic achievement	Ed Tech D		✓ Cite relevant research documenting that the curriculum and teaching strategies promoted through the technology plan improves student academic achievement.
B. Access for teachers and students	Ed Tech C	E-Rate 1A, 1B	✓ Detail how students and teachers will have equitable access to technology resources under the district plan.
C. Innovative instructional delivery strategies	Ed Tech I		✓ Detail the innovative instructional delivery strategies promoted through the technology plan

Technology Plan Elements	Ed Tech Reference	E-Rate Reference	Required Information
D. Timeline (three years minimum)	Ed Tech H	E-Rate 1C	✓ Timeline for implementation of all strategies and activities necessary to accomplish the plan goals and objectives is articulated for the current and each future year that the plan covers (3 years minimum).
E. Parent Involvement and communication	Ed Tech J	E-Rate 1A, 1B	✓ Detail how the district will utilize technology to improve parent involvement and communication with parents.
F. Adult Literacy and Adult Education	Ed Tech K		✓ Detail how the technology and resources acquired assists local Adult Literacy and Adult Education opportunities in the district and community.
III. Professional Development (data driven, ongoing, articulated for a minimum of three years)	Ed Tech A, C, D, E	E-Rate 2A, 2B, 2C, 2D	Provide a description of how the school district will provide **ongoing**, **sustained** professional development for **all** school professionals to further the **effective** use of educational technology. ✓ Assessment of professional development needs ✓ Assessment of the effectiveness of professional development strategy
A. Teachers' technology proficiency	Ed Tech A, C, E	E-Rate 2C, 2D	✓ Assessment of teachers' technology proficiency ✓ Professional development opportunities to meet the identified needs (hardware, software, curriculum and instruction)
B. Teachers' technology use and integration	Ed Tech A, C, E	E-Rate 2C, 2D	✓ Assessment of teachers' technology use and integration ✓ Professional development opportunities to meet the identified needs (hardware, software, curriculum and instruction)
C. Resources to support professional development	Ed Tech A, C, E, M	E-Rate 2A, 2B	✓ Detail the funding, personnel and media resources available to support the districts' professional development strategy
D. Training in technology based delivery of specialized and rigorous academic content	Ed Tech A, C, E, I	2A, 2B	✓ Professional development opportunities to meet the identified needs (hardware, software, curriculum and instruction)
E. Other			
IV. Assessment of Needs (including inventory and replacement schedule articulated for a minimum of three years)	Ed Tech F, H, M	E-Rate 3A, 3B, 3C, 3D	Provide an assessment of the telecommunication services, hardware, software, and other services that will be needed to improve education or library services.
A. Hardware	Ed Tech F, H, M	E-Rate 3A, 3C, 3D	✓ Hardware inventory and replacement schedule articulated (projecting for a minimum of three years) ✓ Assessment of professional development and other supportive services (projecting for a minimum of three years) ✓ Assessment of hardware and software compatibility
1. Compatibility with existing hardware	Ed Tech F, H, M	E-Rate 3A, 3C, 3D	✓ Assessment of hardware and software compatibility

Technology Plan Elements	Ed Tech Reference	E-Rate Reference	Required Information
A. Software	Ed Tech F, H, M	E-Rate 3A, 3C, 3D	✓ Software inventory and replacement schedule articulated (projecting for a minimum of three years) ✓ Assessment of professional development and other supportive services (projecting for a minimum of three years) ✓ Assessment of hardware and software compatibility
1. Compatibility with existing hardware and software	Ed Tech F, H, M	E-Rate 3B, 3C, 3D	✓ Assessment of hardware and software compatibility
B. Telecommunications	Ed Tech F, H, M	E-Rate 3A, 3C, 3D	✓ Assessment of telecommunication needs (projecting for a minimum of three years)
C. Other services	Ed Tech F, H	E-Rate 3A, 3B	✓ Assessment of other services needed
V. Budget (detailed for a minimum of three years)	Ed Tech G, Ed Tech Guidance	E-Rate 4A, 4B	Provide a detailed budget that is **sufficient** to acquire and support the discounted and non-discounted elements of the plan: the hardware, software, professional development, and other services that will be needed to implement the strategies.
A. Demonstrated sufficiency to support the plan (Total budget, explanation of expenditures)	Ed Tech G	E-Rate 4A, 4B	✓ Budget detailed with explanation of expenditures, funding source, ✓ Telephone service, Internet service and other E-Rate fundable items detailed
B. Document coordination of funds from all sources	Ed Tech G	E-Rate 4A, 4B	✓ List the funds and their source that are utilized to support the implementation of the plan
C. Document that federal funds utilized will supplement and not supplant (Ed Tech program requirement)	Ed Tech Guidance		✓ Provide assurance that federal funds will supplement and not supplant local funds in the accomplishment of the technology plan goals, objectives and activities
VI. Evaluation and Accountability	Ed Tech L	E-Rate 5A	Provide a description of the evaluation process that enables the school and district to monitor progress toward the goals and make mid-course corrections in response to new developments and opportunities as they arise. Describe how the district will monitor and evaluate the effectiveness of the funded activities in: integrating technology into the classrooms, increasing the effectiveness of teachers, and enabling students to reach challenging state academic standards.
A. Analysis of student academic achievement data	Ed Tech L	E-Rate 5A	✓ Provide a summary of the district's student academic achievement data and an analysis of how that data impacts the district technology plan, goals, objectives and activities.
B. Analysis of student technological proficiency data	Ed Tech L	E-Rate 5A	✓ Provide a summary of the district's student technological proficiency data and an analysis of how that data impacts the district technology plan goals, objectives and activities.

Technology Plan Elements	Ed Tech Reference	E-Rate Reference	Required Information
C. Analysis of teacher technological proficiency data	Ed Tech L	E-Rate 5A	✓ Provide a summary of the district's teacher technological proficiency data and an analysis of how that data impacts the district technology plan goals, objectives and activities.
D. Analysis of teacher technology use and integration into curriculum and instruction data	Ed Tech L	E-Rate 5A	✓ Provide a summary of the district's teacher technology use data and an analysis of how that data impacts the district technology plan goals, objectives and activities.
E. Ongoing analysis of hardware, software, and telecommunication needs	Ed Tech L	E-Rate 5A	✓ Provide a summary of the hardware, software, and telecommunication accomplishments and an analysis of how the data impacts the district technology plan goals, objectives and activities.
F. Evaluation timeline including plan revision and school board approval	Ed Tech L	E-Rate 5A	✓ Provide an evaluation timeline demonstrating the ongoing evaluation process.
G. Compliance with Children's Internet Protection Act (CIPA) (E-Rate and Ed Tech program requirements)	Ed Tech L	E-Rate 5A	✓ Provide assurance that the district is in compliance with the CIPA requirements.*

***Requirements for CIPA Compliance**

Internet Safety Policy

The district must have an Internet Safety Policy in place that addresses the following issues:

a) access by minors to inappropriate matter on the Internet and World Wide Web;
b) the safety and security of minors when using electronic mail, chat rooms, and other forms of direct electronic communications;
c) unauthorized access, including so-called "hacking," and other unlawful activities by minors online;
d) unauthorized disclosure, use, and dissemination of personal information regarding minors; and
e) measures designed to restrict minors' access to materials harmful to minors.

Technology Protection Measure

The district must have in use, a filter to **block or filter** Internet access and monitor online activities of minors. It must protect against access by adults and minors to visual depictions that are obscene, child pornography, or with respect to use of computers with Internet access by minors - harmful to minors. The filter may be disabled for adults engaged in bona fide research or other lawful purposes.

Public Notice and Hearing

The district must have provided **reasonable public notice** and held at least **one public hearing** to address the proposed Technology Protection Measure and Internet Safety Policy.

Budget Table Example (Add detail as needed to fit local technology plan needs and timeline)					
Item	**Function**	**Source of Funding**	**Year 1**	**Year 2**	**Year 3**
Evaluation/ Accountability	Supports overall success of the technology plan implementation and the effective expenditure of funds Goals 1-4	Local Technology Levy funds	$200	$400	$300
Professional Development	Supports integration and effective use of hardware and software	Title II, Part D	$945	$860	$860
		Title V, Part A	$500 (Math teachers)	$500 (Science Teachers)	$500 (S.S. Teachers)
	Goals 1 & 3	Local Technology Levy funds	$200	$200	$400
		General Fund		$1,000	$1,200
Hardware	Upgrades and replaces current hardware	Local Technology Levy funds	$4,000	$4,000	$5,000
	Goal 2	Title I, Part A	$1,200		$1,200
		General Fund	$2,500	$3,000	$3,000
Software	Supports the technology plan multimedia goal	Local Technology Levy funds	$450	$1,200	$800
	Goal 2	General Fund	$800	$800	$1,200
Telephone	Supports Goals 1 & 4	General Fund	$1,700	$1,800	$1,900

APPENDIX A

Technology Planning Requirements for (ESEA) Title II, Part D Ed Tech and E-Rate

ESEA Title II, Part D-Enhancing Education Through Technology (Ed Tech) Technology Plan Requirements

A. A description of how the applicant will use ESEA Title II, Part D funds to improve student academic achievement, including the technology literacy of all students, and to improve the capacity of teachers to integrate technology effectively into curricula and instruction.

B. The applicant's specific goals for using advanced technology to improve student academic achievement, aligned with Montana Content and Performance Standards.

C. The steps that will be taken to ensure that all students and teachers have increased access to educational technology, including how the LEA will use funds under ESEA Title II, Part D with funds from other sources to ensure that:

1. Students in high-poverty and high-needs schools will have access to technology, and
2. Teachers are prepared to integrate technology effectively into curricula and instruction.

D. A description of how the applicant will identify and promote curricula and teaching strategies that integrate technology effectively into curriculum instruction, based on a review of relevant research, leading to improvements in student academic achievement

E. Provide ongoing, sustained professional development for district staff to further the effective use of technology in the classroom or library media center (a minimum of 25 percent of funds received must be used for professional development).

F. A description of the type and costs of technologies to be acquired under this funding including services, software and digital curricula, and including specific provisions for interoperability among components of such technologies.

G. A description of how the activities provided with funds from this part will be coordinated with funds available from other federal, state and local sources.

H. A description of how technology will be integrated into curricula and instruction and a timeline for such integration.

I. A description of how the applicant will encourage the development and utilization of innovative strategies for the delivery of specialized or rigorous academic courses and curricula through the use of technology, including distance learning technologies, particularly for areas that would not otherwise have access to such courses and curricula due to geographical isolation or insufficient resources.

J. A description of how the applicant will ensure the effective use of technology to promote parental involvement and increase communication with parents, including how parents will be informed of the technology being applied in their child's education so that the parents are able to reinforce at home the instruction their child receives at school

K. A description of how programs will be developed, where applicable, in collaboration with adult literacy service providers to maximize the use of technology.

L. A description of the process and accountability measures that will be used to evaluate the extent to which activities funded are effective in integrating technology into the curricula and instruction, increasing the ability of teachers to teach, and enabling students to meet challenging state academic content and performance standards.

M. A description of the supporting resources (services, software and other electronically delivered learning materials, and print resources) that will be acquired to ensure successful and effective uses of technology.

N. A description of how the local technology plan has been aligned with the goals and objectives of the OPI Ed Tech technology plan (same goals as in the Ed Tech pages of the District's Consolidated Application for Federal Funds). http://www.opi.state.mt.us/EdTech/index.html

Universal Service Fund – E-Rate -Technology Plan Criteria

1. **Clear Goals and a Realistic Strategy for using Telecommunications**

   The plan establishes clear goals and a realistic strategy for using telecommunications and information technology to improve education or library services

   Minimum Criteria

   A. Clear technology/education goals are articulated for the use of technology to improve education,
   B. A realistic strategy is designed and implemented for meeting the goals to improve education, and
   C. Goals are articulated for the current and each future year that the plan covers. Plans may be approved for up to three years for funding under the E-Rate program

   Best Practice Recommendation

   D. District technology goals are aligned with the district's Five-Year Comprehensive Education Plan and other school improvement goals.

2. **Professional Development Strategy**

   The plan has a professional development strategy to ensure that staff knows how to use the new technologies to improve education or library services

   Minimum Criteria

   A. Professional development strategy includes information such as professional development opportunities, professional development available locally (through local/regional providers) and/or participation in curriculum, technology or professional development consortiums, and
   B. Professional development strategy is articulated for the current and each future year that the plan covers. Plans may be approved for up to three years for funding under the E-Rate program.

   Best Practice Recommendations

   C. Data utilized to determine professional development topics, and
   D. Assessment methods to determine effectiveness of professional development experiences are included.

3. **Assessment of Telecommunication, Hardware, Software and Other Services**

   The plan includes an assessment of the telecommunication services, hardware, software and other services that will be needed to improve education or library services

   Minimum Criteria

   A. Hardware, software and other services are included in a district assessment of telecommunication services needed to improve education,
   B. Services such as professional development, wiring and technical support needed are included, and
   C. Assessment of services needed is clearly linked to the district's technology and education goals.

   Best Practice Recommendations

   D. Assessment of services needed is articulated for the current and each future year that the plan covers. Plans may be approved for up to three years for funding under the E-Rate program.

4. **Sufficient Budget**

   The plan provides for a **sufficient budget** to acquire and support the non-discounted elements of the plan: the hardware, software, professional development, and other services that will be needed to implement the strategies.

   Minimum Criteria

   A. District articulated local budget, including funds from all sources, that will provide the necessary support for the services included in the technology plan including the district portion of the discounted services requested under the E-Rate program is included, and
   B. Budget is articulated for the current and each future year that the plan covers. Plans may be approved for up to three years for funding under the E-Rate program.

5. **Evaluation Process**

   The plan includes an **evaluation process** that enables the school or library to monitor progress toward the specified goals and make mid-course corrections in response to new developments and opportunities as they arise.

   Minimum Criteria

   A. Process must include information on the evaluation process, such as, who reviews the plan (technology committee, school board, etc.), how often the plan is reviewed, the information that is utilized to review the plan and the reviewer's ability to make changes to the plan as needed.

APPENDIX B

Assessment Rubric for the Integration of Technology Plan Framework

Integration of Montana Technology Plan Framework –Assessment Rubric
Ed Tech and E-Rate Technology Plan Requirements

Rubric Scoring

0 Information is absent for the criteria
1 Information is incomplete for the criteria
2 Information provided meets or exceeds

District Name _____
CO _____LE _____
Date _____

Technology Plan Elements	Ed Tech Reference	E-Rate Reference	0	1	2	Comments
I. Goals and Strategies for Use of Technology and Telecommunication	Ed Tech A, B	E-Rate 1A, 1B, 1C, 1D				
A. Goals (Multi-year, three years minimum aligned with state OPI Ed Tech Plan)	Ed Tech B	E-Rate 1C				
B. Academic Achievement, aligned with 5YCEP goals	Ed Tech A, B					
C. Student and Teacher Technology Literacy	Ed Tech A	E-Rate 1A, 1B, 1D				
II. Strategies (realistic)	Ed Tech C, D, H, I, J, K	E-Rate 1A, 1B, 1C				
A. Promotion of research based Curricula and Teaching Strategies that Integrate Technology	Ed Tech D	E-Rate 1A, 1B				
1. Based on a review of relevant research	Ed Tech D					
2. Aligned to Montana Content and Performance Standards	Ed Tech D					
3. Proven to improve student academic achievement	Ed Tech D					
B. Access for teachers and students	Ed Tech C	E-Rate 1A, 1B				
C. Innovative instructional delivery strategies	Ed Tech I					
D. Timeline (three years minimum)	Ed Tech H	E-Rate 1C				
E. Parent Involvement and communication	Ed Tech J	E-Rate 1A, 1B				
F. Adult Literacy and Adult Education	Ed Tech K					
III. Professional Development (data driven, ongoing, articulated for a minimum of three years)	Ed Tech A, C, D, E	E-Rate 2A, 2B, 2C, 2D				
A. Teacher technology proficiency	Ed Tech A, C, E	E-Rate 2C, 2D				
B. Teachers technology use and integration	Ed Tech A, C, E	E-Rate 2C, 2D				
C. Resources to support professional development	Ed Tech A, C, E, M	E-Rate 2A, 2B				
D. Training in technology based delivery of specialized and rigorous academic content	Ed Tech A, C, E, I	E-Rate 2A, 2B				

Technology Plan Elements	Ed Tech Reference	E-Rate Reference	0	1	2	Comments
E. Other						
IV. Assessment of Needs (including inventory and replacement schedule articulated for a minimum of three years)	Ed Tech F, H, M	E-Rate 3A, 3B, 3C, 3D				
A. Hardware	Ed Tech F, H, M	E-Rate 3A, 3C, 3D				
1. Compatibility with existing hardware	Ed Tech F, H, M	E-Rate 3A, 3C, 3D				
B. Software	Ed Tech F, H, M	E-Rate 3A, 3C, 3D				
1. Compatibility with existing hardware and software	Ed Tech F, H, M	E-Rate 3B, 3C, 3D				
C. Telecommunications	Ed Tech F, H, M	E-Rate 3A, 3C, 3D				
D. Other services	Ed Tech F, H	E-Rate 3A, 3B				
V. Budget (detailed for a minimum of three years)	Ed Tech G, Ed Tech Guidance	E-Rate 4A, 4B				
A. Demonstrated sufficiency to support the plan (Total budget, explanation of expenditures)	Ed Tech G	E-Rate 4A, 4B				
B. Document coordination of funds from all sources	Ed Tech G	E-Rate 4A, 4B				
C. Document that federal funds utilized will supplement and not supplant (Ed Tech program requirement)	Ed Tech Guidance					
VI. Evaluation and Accountability	Ed Tech L	E-Rate 5A				
A. Analysis of student academic achievement data	Ed Tech L	E-Rate 5A				
B. Analysis of student technological proficiency data	Ed Tech L	E-Rate 5A				
C. Analysis of teacher technological proficiency data	Ed Tech L	E-Rate 5A				
D. Analysis of teacher technology use and integration into curriculum and instruction data	Ed Tech L	E-Rate 5A				
E. Ongoing analysis of hardware, software, and telecommunication needs	Ed Tech L	E-Rate 5A				
F. Evaluation timeline including plan revision and school board approval	Ed Tech L	E-Rate 5A				
G. Compliance with Children's Internet Protection Act (CIPA) (E-Rate and Ed Tech program requirements)	Ed Tech L	E-Rate 5A				

APPENDIX C

Glossary of Technology Terms

SCII - (American Standard Code for Information Interchange) A seven-bit binary code standardized by ANSI for use by personal computers and some mainframes to represent alphanumeric and graphical characters. An additional bit is included to form an eight-bit character byte.

Analog Transmission - Transmission of a continuously variable signal at a constant rate. The normal way of transmitting a voice signal has been through analog transmission.

Application - Software that performs a specific function, such as e-mail.

Automated Circulation System - A library system in which some or all of the activities related to the loan of library materials are performed by computerized procedures.

Backbone - A wiring scheme that is used to provide interconnections between telecommunications closets, equipment rooms, and entrance facilities in a telecommunications wiring system.

Bandwidth – The range of frequencies that can be passed by a transmission medium. A measure of the information transmission capacity of a medium to transmit a signal. The greater the bandwidth, the greater the amount of information that can travel over the medium at one time.

Bridge - A device used to connect local or wide-area networks that use the same protocol.

Broadband - A transmission method in which the bandwidth can be shared by multiple simultaneous signals because the network's range of transmission frequencies is divided into separate channels, with each channel used to send a different signal.

CAT 5 (category 5 cable) - Eight standard copper telephone wires, encased in a plastic sheath.

Central Processing Unit (CPU) - The unit that executes programmed instructions, performs the logical and arithmetic functions on data and controls input/output functions.

Client - A node that requests services from a server.

Client-Serve Computing - A technique in which processing can be distributed between nodes requesting information (clients) and those maintaining data (servers).

Coaxial Cable (COAX) - A transmission medium with a single-wire conductor. It is noted for its wide band width and its low susceptibility to interference. The capacity of coaxial cable is much more limited than that of fiber optic cable.

Common Carrier - A licensed, private, utility company that supplies data and voice communications services.

Compact Disk Read Only Memory (CD-ROM) - A prerecorded, non-erasable disc that can store over 650 MB of digital data equal to 250,000 pages of text or 20,000 medium resolution images.

Compressed Video - Video and audio signals converted from regular analog signals to digital signals, making it possible for a network to carry more information.

Computer Applications - The use to which a processing system is put, such as word processing and creating spreadsheets and mailing lists.

Computer-Assisted Design (CAD) - A term applied to programs (and workstations) used in designing engineering, architectural and scientific models ranging from simple tools to buildings, aircraft, integrated circuits and molecules.

Computer-Assisted Instruction (CAI) - A type of educational program designed to serve as a teaching tool. CAI programs use tutorials, drills, and questions-and-answer sessions to present a topic and to test the student's comprehension.

Computer Literacy - A functional working knowledge of a number of the generic tools, at a level consistent with one's overall education. Thus, as students increase the depth and breadth of their overall education, they are expected to grow in the breadth and depth of use of the generic computer tools.

CPE (customer premises equipment) - Telecommunications equipment that is physically on-site at a school, business, or home.

Data Network - A communication system used for data transmission that has the potential to provide multiple access paths among users.

Dedicated Phone Line - A telephone line used for a specific telecommunications activity, i.e., a modem line used for dial-in/out only.

Desktop Publishing - Using a personal computer to produce high-quality printed output ready for commercial printing.

Digital Transmission - A transmission of discrete, separate pulses or signal levels; it contrasts with analog transmission.

Distance Learning - An organized system of delivering educational information and materials between two or more geographical separate sites through a variety of transmission modes. With the advent of the Internet, distance learning opportunities have experienced a dramatic increase.

E-Mail (electronic mail) - Written messages that are transmitted across networks or within one network. The messages are usually stored on an e-mail server and can be accessed by the addressee only.

Ethernet- A name for a physical layer networking protocol that is based on a contention access scheme. Originally running at 10 Mbps over coax, the standard now also runs over twisted pair wire (10BaseT) and Fiber (10BaseF). A faster variant of the standard runs at 100 Mbps (called "Fast Ethernet" or "100BaseT"). A still faster emerging standard is called "Gigabit Ethernet" and will run at speeds of 1,000 Mbps.

Fiber Optic Cable - Glass or plastic fibers over which modulated light pulses from laser or LED (light emitting diode) can transmit data. It is not subject to interference or electronic eavesdropping.

Fiber Optics - A signal conducting a medium that conveys light waves through transparent fiber. It allows high speed transfer of voice, video and data.

File Transfer Protocol (FTP) - An Internet protocol that allows for files and programs to be moved or downloaded from one computer to a remote computer.

Full-Motion Video - A standard video signal for 30 frames per second and 525 horizontal lines per frame, which is capable of complete action.

Gateway - A device connecting two or more networks that may use different protocols and media. Gateways can connect local area networks or wide-area networks.

Gigabyte (Gb) - A measurement of memory space equal to a billion bytes.

Gopher - Software which permits searching of files on the Internet or remote hosts using layered menus. Text from these files can be read online or transferred to a computer.

Hardware - The physical components of a computer system, such as circuitry, keyboard and display.

Hypermedia - A computer can be used as the "glue" connecting multimedia. When this is done, the media can be used in an interactive, non-linear manner, and can include use of a full range of computer capabilities.

Hypertext - Linking related information. Selecting a word in a sentence, and retrieving information about that word, if it exists, or the next occurrence where the work is found.

Infrastructure - The basic facilities, equipment and installations needed for the functioning of a system.

Interactive media - A program that interacts with the user, who is usually (although not necessarily) sitting at a display of some sort and who is using some sort of input device to provide responses to the program.

Internet - A group of interconnected networks. The National Science Foundation (NSF) was given responsibility for supervision of the Internet when the Department of Defense separated Milnet, the military production network, from research network in 1983.

Internet Compatible - Computer has sufficient operating speed, hard drive capacity and RAM to load or download information and graphics and can accept an internal or external modem or can be networked to a server.

Intranet - A group of interconnected networks set up to distribute information within an organization and usually only accessible within the organization; it may use a familiar World Wide Web browser for navigation.

Internet Service Provider (ISP) - A business or enterprise that acts as an intermediary between the Internet and the connecting individual or agency. Usually geographically close, the connecting site can vary from a commercial organization to a university.

ISDN (integrated services digital network) - A network specification for transmitting voice, data, and video over existing, two- or four-wire telephone lines; it is not yet widely available.

LAN (local area network) - A computer network located within a building or group of buildings. The network is a system of software and hardware and is usually connected by a common data transmission medium.

LCD (liquid crystal display) - A display technology that uses rod-shaped molecules that flow like liquid and bend light.

LCD Panel - Also called a projection panel, it is a data projector that accepts computer output and displays it on a see-through liquid crystal screen that is placed on top of an overhead projector.

Mb (megabyte) - A measure of memory equal to one million bytes.

MHZ (megahertz) - One million cycles per second.

Microwave Transmission - Sending high frequency radio waves from a tower at one point through the air to a receiving dish at another site.

Modem (modulator-demodulator) - A device that connects a computer and a telephone line, or a terminal server and a telephone line. It converts digital and analog signals.

Multimedia Equipped - has software installed, e.g., hypercard, that allows use of slides, movies, overhead projection, audio tape, video tape, CD Rom or laser discs in combination of two or more.

Network - A system of software and hardware connected in a way to support data transmission.

Network Device - A computer, printer, modem, or any other device connected to a network.

NIC (network interface card) - An adapter board that provides the physical connection between a computer and the network medium.

Node - Any device on a network that has an address.

NOS (network operating system) - Controlling software for a network that oversees resource sharing and can provide security and administrative tools.

OnLine - Establishing a connection with another computer via telephone lines or through a network.

Protocol - A standardized set of rules that specify the format, timing, sequencing, and error checking for data transmission between network devices.

Print Server - A network device that allows multiple users to send print jobs to a printer regardless of whether that printer is currently busy.

RAM (Random Access Memory) - A storage device into which data can be entered and read. Information stored is lost when the computer's poser is turned off.

Repeater - A device that regenerates signals to extend transmission distance.

Relevant Research – See Scientifically Based Research

Research Based Strategy – Strategies for the effective and efficient infusion of technology into curriculum and instructional practices supported by scientifically based research.

Router - A network device that connects networks and forwards data of a specific protocol type based on an address.

Scanner - A device that reads text, images and bar codes. Text and bar code scanners recognize printed fonts and bar codes and convert them into a digital code.

Scientifically Based Research - Defined in section 9101(37) of the NCLB act, scientifically based research involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs.

Server - A network device that provides shared resources and services to other network devices (clients).

Software - A program or set of instructions that tells a computer how to accept and manipulate data in order to turn it into information.

Sound Card - A personal computer expansion board that records and plays back sound, providing outputs directly to speakers or an external amplifier.

TCP/IP (Transmission Control Protocol/Internet Protocol) - A set of computer commands that dictate how the computers on the Internet will communicate with each other.

T1 - A 1.544 megabit per second (Mbps) multichannel transmission system for voice and/or data provided by common carriers.

Technology Integration into Curriculum and Instruction – The effective and efficient infusion of technology into curriculum and instructional practices to improve student learning.

Technology Proficient Teacher – A teacher trained in the effective and efficient use of technology in teaching and learning who can demonstrate, in a variety of ways, their proficiency with the knowledge, skills and abilities they possess relevant to instructional technology.

Technology Proficient Student - A student who possesses knowledge, skills and abilities with technology that allows them to effectively and efficiently utilize technology to learn and to demonstrate their learning.

Telecommunications - The transfer of data from one location to another over communication lines.

Telecomputing - A subset of telecommunications, which is the process of communicating electronically from one place to another.

Teleconferencing - Simultaneous visual and/or sound interconnecting using telecommunication links that allow individuals in remote locations to see and communicate with each other in a conference arrangement.

Telenet - An Internet service that allows users to log on to remote host computers as "guest" users, providing access to the files as if they were actually at the host site.

Terminal Server - A network device that connects remote computers to a network through the use of telephone lines and modems.

Token Ring - A four or 16 megabits per second (Mbps) network protocol using a ring topology and a token-passing access method.

Two-Way video and audio - The ability to transmit and receive pictures and sound simultaneously in real time.

Upgrade - The process of changing to a newer, usually more powerful version of a computer system or a component.

Uplink - A satellite dish that transmits signals up to a satellite. These signals are then sent back to Earth to a downlink (receiving) site.

URL (uniform resource locator) - The generic set of all names/addresses that can lead to any file on any machine anywhere in the world.

Videoconferencing - A form of teleconferencing where participants see and hear other participants in remote locations. Video cameras, monitors, codecs and networks allow synchronous communication between sites.

WAN (wide area network) - A network capable of transmissions over large, geographic areas.

Wireless - Voice, data or video communications without the use of connecting wires.

WWW (World Wide Web) - A hypermedia information retrieval system linking a variety of Internet-accessible documents and data files (text and graphics). Often referred to as "the Web."

APPENDIX D

Planning, Research and Evaluation References

CARET, (http://caret.iste.org/)

"CARET bridges education technology research to practice by offering research-based answers to critical questions."

Metiri, (http://www.metiri.com)

"Looking to inform your decision-making about technology with sound, reliable research? Finding it difficult to locate research aligned to your interests, and even more difficult to know which research findings are significant and which are not?

"Metiri Group's Technology Solutions that Work (TSW) database puts research at your fingertips, providing an in-depth, unbiased analysis of research on technology solutions and software designed for K-12 schools."

National Staff Development Council, (nsdc.org/)

The National Staff Development Council (NSDC) is committed for ensuring success for all students through staff development and school improvement. Our goal is that all teachers in schools will experience high quality professional learning as a part of their every day work by 2007.

Network of Regional Technology in Education Consortiums, (http://www.rtec.org/)

"The Regional Technology in Education Consortia (R*TEC) program is established to help states, local educational agencies, teachers, school library and media personnel, administrators, and other education entities successfully integrate technologies into kindergarten through 12th grade (K-12) classrooms, library media centers, and other educational settings, including adult literacy centers."

Northwest Regional Educational Laboratory –(NWREL), (http://www.nwrel.org/index.html)

"The Northwest Regional Educational Laboratory improves educational results for children, youth, and adults by providing research and development assistance in delivering equitable, high-quality educational programs. The Northwest Regional Educational Laboratory (NWREL) provides research and development assistance to education, government, community agencies, business, and labor. NWREL's **primary service area** is the Northwest states of **Alaska**, **Idaho**, **Montana**, **Oregon**, and **Washington**. "

Northwest Educational Technology Consortium (NETC) - (http://www.netc.org/)

"The Northwest Educational Technology Consortium (NETC) has been providing services and products in the Northwest since 1995. The consortium is made up of the state education agencies from Alaska, Idaho, Montana, Oregon, and Washington, and the Northwest Regional Educational Laboratory in Portland, Oregon. NETC is one of the networks of 10 Regional Technology in Education Consortia in the United States and receives funding from the U.S. Department of Education."

What Works Clearinghouse, (http://www.whatworks.ed.gov/)
"On an ongoing basis, the What Works Clearinghouse (WWC) collects, screens, and identifies studies of the effectiveness of educational interventions (programs, products, practices, and policies). We review the studies that have the strongest design, and report on the strengths and weaknesses of those studies against the WWC Evidence Standards so that you know what the best scientific evidence has to say."

Resources Utilized in the Development of this Framework

Enhancing Education Through Technology (ESEA Title II, Part D), Program Guidance, U.S. Department of Education
E-Rate Technology Plan Criteria, Schools and Library Division of the Universal Services Administrative Corporation
Liz Cunningham, TEST, Missoula, Montana
Dr. Tammy Elser, Federal Programs Director, Arlee Public Schools, Arlee, Montana
Gary Graves, Senior Associate, Northwest Regional Technology Consortium
Michael Hall, Title II, Part D Specialist, Montana Office of Public Instruction
Maureen Jones, Technology Grant Co-Coordinator, Superior Public Schools
Dr. Claudette Morton, Director, Montana Small Schools Alliance
Fred Siedensticker, Northern Rockies Educational Services
Technology Plan Criteria of Oregon's Enhancing Education Through Technology (ESEA Title II, Part D)
Diane Woodard, Technology Coordinator, Superior Public Schools, Superior, Montana
Bill Woodford, Superintendent, Superior Public Schools, Superior, Montana